

DaimlerChrysler AG

Patent claims

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1. A device for producing a hollow section or shell section by means of a hydroforming (HF) tool, having at least one die in which a component to be formed into a hollow section or shell section is accommodated, and at 10 least one plunger which can be placed against the die in the axial/longitudinal direction of the hollow section or shell section and seals off said die, characterized in that at least two radially displaceable notching punches (14) for forming notches (22) spaced apart in the 15 peripheral direction of the hollow section or shell section (2) are integrated in the HF tool (3), in that the device (1) comprises a parting device, which is separate from the notching punches (14) and is intended for severing the hollow section or shell section (2) 20 between the lateral notch margins (29) running in the component longitudinal direction, while forming an extension section (27), and a bending device for bending over the extension section (27) outside the HF tool (3) to form a flange section of the hollow section or shell 25 section (2).

2. The device as claimed in claim 1, characterized in that the device also comprises a cutting device (15) which is separate from the notching punches (14) and is 30 intended for initially cutting the hollow section or shell section (2) along the terminating edge (31) of the extension section (27) to be produced and which is arranged inside the HF tool (3) and directly adjoins the notching punches (14) in the peripheral direction of the 35 tool cavity (6), and in that the parting device severing the hollow section or shell section (2) along the initial

cut is arranged outside the HF tool (3).

3. The device as claimed in claim 1, characterized in that the device (1) also comprises a cutting device (15) which is separate from the notching punches (14) and is intended for cutting through the hollow section or shell section (2) along the terminating edge (31) of the extension section (27) to be produced except for a thin, axial web (30) adjoining the notch margins (29) and which 5 is arranged inside the HF tool (3) and adjoins the notching punches (14) at a slight distance apart in the peripheral direction of the tool cavity (6), and in that the parting device severing the hollow section or shell section (2) at the location of the web (30) is arranged 10 15 outside the HF tool (3).

4. The device as claimed in claim 1, characterized in that the parting device for cutting through the hollow section or shell section (2) along the terminating edge (31) of the extension section (27) to be produced is arranged inside the HF tool (3), in which case it 20 directly adjoins the notching punches (14) in the peripheral direction of the tool cavity (6) but is axially offset from said notching punches (14) in their 25 engagement region.

5. The device as claimed in claim 4, characterized in that the parting device is formed by cutting punches.

30 6. A method of producing a hollow section or shell section by means of hydroforming, in which internal high pressure is applied to a component for forming a hollow section or shell section in an HF tool, the component remaining in the HF tool being trimmed at the periphery 35 during or at the end of the hydroforming at an axial distance from the component end for forming at least one

extension section running in the axial/longitudinal direction of the hollow section or shell section, characterized in that the hollow section or shell section (2) is trimmed by means of radially displaceable notching punches (14), integrated in the HF tool (3), in such a way that notches (22) spaced apart in the peripheral direction are formed, in that the hollow section or shell section (2) is severed by means of a parting device, separate from the notching punches (14), between the lateral notch margins (29) running in the component longitudinal direction, with the extension section (27) being formed, and in that the extension section (27) is then bent over outside the HF tool (3) to form a flange section of the hollow section or shell section (2).

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7. The method as claimed in claim 6, characterized in that the hollow section or shell section (2) is initially cut by means of a cutting device (15), separate from the notching punches (14), inside the HF tool (3) along the terminating edge (31) of the extension section (27) to be produced, and in that the hollow section or shell section (2) is severed outside the HF tool (3) along the initial cut by means of the parting device.

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8. The method as claimed in claim 6, characterized in that the hollow section or shell section (2) is cut through by means of a cutting device (15), separate from the notching punches (14), inside the HF tool (3) along the terminating edge (31) of the extension section (27) to be produced except for a thin, axial web (30) adjoining the notch margins (29), and in that the respective web (30) is severed by means of the parting device outside the HF tool (3).

9. The method as claimed in claim 6, characterized in that the hollow section or shell section (2) is cut

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through inside the HF tool (3) by means of the parting device along the terminating edge (31) of the extension section (27) to be produced.